

F²MC-16L/16LX EMULATOR

MB2147-01 HARDWARE MANUAL

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PREFACE

■ Using the product safely

This manual provides important information on using this product safely. Read this manual carefully before using the product to ensure correct use. In particular, carefully read "Safety Precautions" in this Preface before using the product so that you understand the requirements for safe use of the product.

After reading this manual, keep it handy for reference.

■ Objectives and intended readers

The MB2147-01 is a development support tool used to develop and evaluate application products that use the Fujitsu F²MC-16L/16LX microcontroller.

This manual is intended for the engineers who use the MB2147-01 (called the "emulator unit" in this manual) to develop F²MC-16L and F²MC-16LX application products. The manual explains how to handle and connect the emulator unit.

■ Guarantee and liability

The specifications of this product may be changed without prior notice. The publisher assumes no responsibility for any effect or incident resulting from the operation of this product.

■ Trademark

F²MC is the abbreviation of FUJITSU Flexible Microcontroller.

Other system and product names in this manual are trademarks of respective companies or organizations.

The symbols TM and ® are sometimes omitted in this manual.





■ **Safety precautions**

The table below lists important precautions contained in this manual and the pages on which they occur.

Before using the product, read these pages so that you fully understand the requirements for safe use of the product.




This symbol indicates that incorrect use of the product may result in death or serious injury to the user.

Warning	Description	Page
<p>Electric shock</p> 	<p>Do not touch the inside of a connector port. Doing so may result in electric shock or device problems.</p>	<p>16</p>
<p>Plug</p> 	<p>If the product emits excessive heat, smoke, an offensive smell, or an unusual noise, turn off power immediately. Then, disconnect the power plug from the outlet. If smoke was detected, make sure that no more smoke is coming from the product. Then, contact our sales or support department to request that the product be repaired. Do not attempt to repair the product by yourself. Otherwise, personal injury, damage to the product, or other property damage may result. Using such a product without having it properly repaired may result in fire or electric shock.</p>	<p>15</p>
	<p>If water or other liquid, a metallic object, or other foreign matter enters the product, immediately turn off power, and disconnect the power plug from the outlet. Then, consult with our sales or support department. Using the product under such abnormal conditions may result in device problems, fire, or electric shock.</p>	<p>15</p>
	<p>Disconnect the power plug during electrical storms. Using the product during an electrical storm may result in damage to the product or fire.</p>	<p>16</p>
<p>No disassembly</p> 	<p>Do not open the product case. Do not modify the product without permission. Doing so may result in device problems, fire, or electric shock.</p>	<p>16</p>
<p>No moisture</p> 	<p>Do not use the product near water such as near a bath or shower. Doing so may result in device problems, fire, or electric shock.</p>	<p>16</p>



⚠ WARNING

This symbol indicates that incorrect use of the product may result in death or serious injury to the user.

Warning	Description	Page
Prohibition 	Do not touch the product with wet hands. Doing so may result in electric shock.	17
	Do not place the product in a location exposed to excessive moisture or dust or in a poorly ventilated location. Do not place the product near an open flame. Doing so may result in device problems, fire, or electric shock.	17
	Do not block the product ventilation holes. Doing so may cause generation of excessive heat, possibly resulting in a fire.	17, 19
	Do not insert metallic, combustible, or other objects or allow them to drop into the product through a ventilation hole or other opening. Doing so may result in device problems, fire, or electric shock.	17
	Do not use a voltage other than the indicated value of supply voltage. Do not connect power cable together with too many plugs to an outlet. Doing so may result in fire or electric shock.	17
	The product must not be scratched, modified, forcibly bent, pulled, twisted, or exposed to heat. Do not place heavy objects on the product. Doing so may result in device problems, fire, or electric shock.	17
	Do not use the product if it has a fault, damage, or sever wires in the cable. Doing so may result in fire or electric shock.	19


⚠ CAUTION

This symbol indicates that incorrect use of the product may result in minor or moderate injury to the user, in damage to the product and any devices connected to it, or in the destruction of data and other software resources or other property.

Warning	Description	Page
<p>Plug</p> 	<p>Disconnect the power plug before moving the product. Disconnect all other connected cables. Exercise caution when working near cables on the floor. Damage to a cable may result in fire or electric shock. A falling device may result in injury.</p>	18
	<p>If the product is not to be used for an extended period, disconnect the power plug. Doing so may result in fire or electric shock.</p>	18
<p>Prohibition</p> 	<p>Do not place the product in a location exposed to shock or a location that is not level or stable. Doing so may result in device problems or the product falling over or falling on the floor.</p>	18
	<p>Do not grasp the cable when unplugging the power plug and cable. Always grasp the power plug or connector itself. Pulling the cable may expose conductors or sever wires in it, possibly resulting in device problems, fire, or electric shock.</p>	18, 19, 25, 26, 27, 28, 29, 30, 31, 32
	<p>Do not place the product in a location, such as near a speaker or television tuner, where it is exposed to an electromagnetic field. Doing so may result in device problems.</p>	18
	<p>Make sure that power to the product is turned off and the power plug is disconnected from outlets before connecting or disconnecting cables, removing or mounting boards, handling switches or jumpers, or mounting parts (unless such an operation uses USB cables for plug-and-play devices). Doing so may result in device problems or electric shock.</p>	19
	<p>To prevent device damage by electrostatic discharge, do not touch, and do not let any object contact pins of connectors or other parts of the product. Before handling the product, be sure to discharge static electricity from your body by touching a metallic object, such as doorknob. Doing so may result in device problems.</p>	19
	<p>Do not apply any shock to this product. Doing so may result in device problems.</p>	20
	<p>Do not expose the product to direct sunlight, and do not place it where it is hot and humid. Do not allow condensation to form on the product.</p>	20
	<p>Do not store the product in a dusty location. Doing so may result in device problems.</p>	20
<p>Do not store the product where it is exposed for a long time to relatively strong electric or magnetic fields. Because the product uses many electronic components, problems may result.</p>	20	



⚠ CAUTION

This symbol indicates that incorrect use of the product may result in minor or moderate injury to the user, in damage to the product and any devices connected to it, or in the destruction of data and other software resources or other property.

Warning	Description	Page
<p>Prohibition</p> 	<p>Make sure that power to the product is turned off and the power plug is disconnected from outlet before removing or mounting boards. Doing so may result in device problems or electric shock.</p>	<p>23</p>
	<p>When mounting a board, make sure that it is mounted in the proper direction. Doing so may result in device problems.</p>	<p>23</p>
	<p>Do not apply pressure on one part of a board when mounting the board. Attempt to distribute equal pressure on the entire board. Doing so may result in damage to the board.</p>	<p>23</p>
	<p>Make sure that power to the product is turned off and the power plug is disconnected from outlets before connecting or disconnecting cables. Doing so may result in device problems or electric shock.</p>	<p>25, 26, 27, 28, 29, 31, 32</p>
	<p>Make sure that power to the product is turned off and the power plug is disconnected from outlets before connecting or disconnecting cables (unless such an operation uses USB cables for plug-and-play devices). Doing so may result in device problems or electric shock.</p>	<p>30</p>
	<p>Make sure that power to the product is turned off and the power plug is disconnected from outlets before mounting the evaluation MCU. Doing so may result in device problems or electric shock.</p>	<p>34</p>
	<p>Make sure that power to the product is turned off and the power plug is disconnected from outlets before mounting crystal unit or handling switches or jumpers. Doing so may result in device problems or electric shock.</p>	<p>35</p>
	<p>Make sure that power to the product is turned off and the power plug is disconnected from outlets before handling jumpers. Doing so may result in device problems or electric shock.</p>	<p>38, 40</p>
	<p>Make sure that power to the product is turned off and the power plug is disconnected from outlets before handling switches. Doing so may result in device problems or electric shock.</p>	<p>41, 42</p>
	<p>Follow the procedure described in the manual to turn on the product. Doing so may result in device problems.</p>	<p>47</p>
	<p>After power is turned on to the product, do not move the system, or apply any shock or vibration to it. Doing so may result in device problems.</p>	<p>47</p>
	<p>Follow the procedure described in the manual to turn off the product. Doing so may result in device problems.</p>	<p>49</p>



This symbol indicates that incorrect use of the product may result in minor or moderate injury to the user, in damage to the product and any devices connected to it, or in the destruction of data and other software resources or other property.

Warning	Description	Page
Attention 	To re-transport the product, use the package used at the delivery, and pack them as it was packed. Doing so may result in damage to the product.	2
Caution 	Insert the power plug so that the connection is secure. Doing so may result in device problems or fire. Use the product according to its specifications. Doing so may result in device problems.	18, 32 5

■ Organization of this Manual

This manual consists of three chapters. Be sure to read the manual before using the emulator.

CHAPTER 1 "PRODUCT HANDLING AND SPECIFICATIONS"

This chapter gives an overview, including specifications, and explains how to handle the emulator.

Before using the emulator, be sure to read this chapter and check the packed components of the emulator.

CHAPTER 2 "CONNECTING THE EMULATOR"

This chapter explains how to connect the emulator.

Read this chapter before turning on the emulator.

CHAPTER 3 "OPERATING THE EMULATOR"

This chapter explains basic operations of the emulator.

Read this chapter before turning on the emulator.

■ Related manuals

Also read the following manuals:

- Hardware Manual of the evaluation MCU used
- Adapter Board Hardware Manual
- Operation Manual of the probe cable used
- Operation Manual of the probe header used
- Softune Workbench Operation Manual

- The contents of this document are subject to change without notice. Customers are advised to consult with FUJITSU sales representatives before ordering.
- The information and circuit diagrams in this document are presented as examples of semiconductor device applications, and are not intended to be incorporated in devices for actual use. Also, FUJITSU is unable to assume responsibility for infringement of any patent rights or other rights of third parties arising from the use of this information or circuit diagrams.
- The products described in this document are designed, developed and manufactured as contemplated for general use, including without limitation, ordinary industrial use, general office use, personal use, and household use, but are not designed, developed and manufactured as contemplated (1) for use accompanying fatal risks or dangers that, unless extremely high safety is secured, could have a serious effect to the public, and could lead directly to death, personal injury, severe physical damage or other loss (i.e., nuclear reaction control in nuclear facility, aircraft flight control, air traffic control, mass transport control, medical life support system, missile launch control in weapon system), or (2) for use requiring extremely high reliability (i.e., submersible repeater and artificial satellite).
Please note that Fujitsu will not be liable against you and/or any third party for any claims or damages arising in connection with above-mentioned uses of the products.
- Any semiconductor devices have an inherent chance of failure. You must protect against injury, damage or loss from such failures by incorporating safety design measures into your facility and equipment such as redundancy, fire protection, and prevention of over-current levels and other abnormal operating conditions.
- If any products described in this document represent goods or technologies subject to certain restrictions on export under the Foreign Exchange and Foreign Trade Law of Japan, the prior authorization by Japanese government will be required for export of those products from Japan.

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CHAPTER 1 PRODUCT HANDLING AND SPECIFICATIONS

This chapter gives an overview, including specifications, and explains how to handle the emulator.

Before using the emulator, be sure to read this chapter and check the product information.

- 1.1 "Checking Packed Components"
- 1.2 "Appearance and Part Names"
- 1.3 "General Specifications"
- 1.4 "RS-232C Port Specifications"
- 1.5 "USB Port Specifications"
- 1.6 "LAN Port Specifications"
- 1.7 "External Trigger Input Terminal Specifications"
- 1.8 "Program Execution Output Terminal Specifications"
- 1.9 "Power-On Debug Specifications"
- 1.10 "Options"
- 1.11 "Precautions about Possible Problems"
- 1.12 "Precautions on Handling the Emulator"
- 1.13 "Precautions on Use"

1.1 Checking Packed Components

Before using the emulator unit, check the packed components to make sure that all components are included.

■ Checking packed components



Attention



To re-transport the product, use the package used at the delivery, and pack them as it was packed. Doing so may result in damage to the product.

Before using the emulator unit, make sure that the packed components include the following:

- Emulator unit: 1 unit
- AC adapter: 1 unit
- AC cord: 1 cord
- Flat cable 1 (standard length): 2 cables
- Flat cable 2 (long): 2 cables
- Hardware manuals (in Japanese and English [this manual]): one in each language

Note:

The AC cord and AC adapter are packed in the same box.

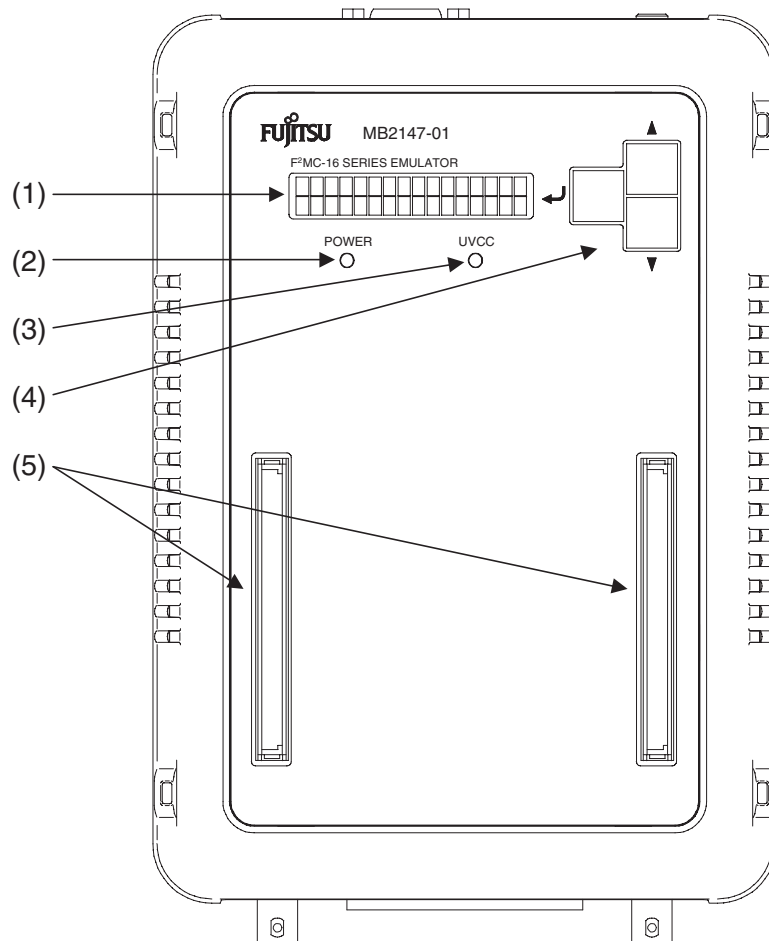
1.2 Appearance and Part Names

This section gives the names of all parts of the emulator unit.

■ Appearance and Part Names

Figure 1.2-1 "Top view of the emulator unit" to Figure 1.2-3 "Rear view of the emulator unit" show the exterior of the emulator unit and give the names of all of its parts.

Figure 1.2-1 Top view of the emulator unit

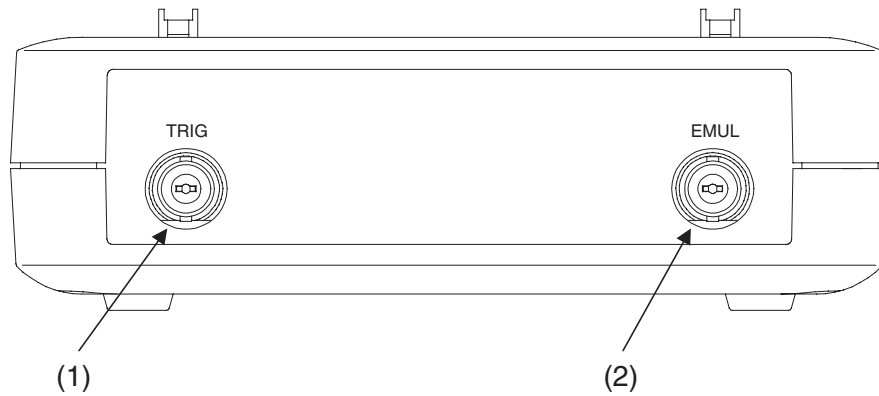


No.	Name	Description
(1)	Status indicator LCD	Displays different kinds of information, including setting values, communication status, and operating status. ^(*1)
(2)	POWER LED	Goes on when emulator power is supplied.
(3)	UVCC LED	Goes on when user system power (UV _{CC}) is supplied. ^(*2)
(4)	Setting switches	Used to change settings and the information displayed on the status indicator LCD. ^(*1)
(5)	Adapter board connector	Connects to an adapter board (option).

*1: For information on the type of information displayed on the status indicator LCD and how to use the setting switches, see Section 3.7 "Using the Setting Switches."

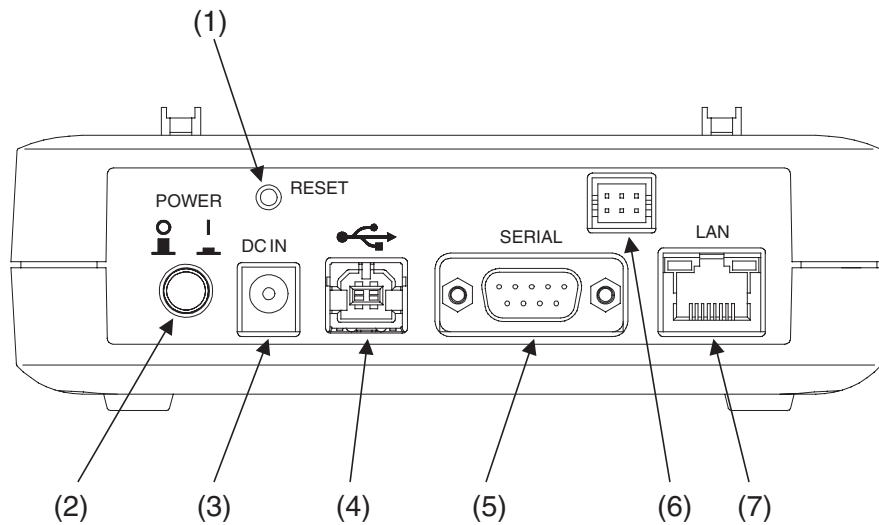
*2: If the evaluation MCU has a dual source power supply, this LED goes on when both power supplies are turned on.

Figure 1.2-2 Front view of the emulator unit



No.	Name	Description
(1)	TRIG terminal	Used to input external trigger signals.
(2)	EMUL terminal	Outputs a program execution signal.

Figure 1.2-3 Rear view of the emulator unit



No.	Name	Description
(1)	RESET switch	Resets the emulator.
(2)	POWER switch	Turns on the emulator.
(3)	DC inlet	Connects to the AC adapter provided as an accessory.
(4)	USB connector	Connects to a USB cable.
(5)	RS-232C connector	Connects to an RS-232C cable.
(6)	TEST terminal	Connects to a cable used for product testing. Do not use this terminal.
(7)	LAN connector	Connects to a LAN cable.

1.3 General Specifications

This section covers the general specifications of the emulator.

■ General specifications

CAUTION

Caution



Use the product according to its specifications. Doing so may result in device problems.

Table 1.3-1 "General specifications" lists the general specifications of the emulator.

The following names used in this manual have the following definitions:

- Emulator: Emulator unit + adapter board
- Emulator system: Emulator unit + adapter board + probe

Table 1.3-1 General specifications

Item	Specification	
Name	F ² MC-16L/16LX Emulator	
Model name	MB2147-01	
Emulator power supply	Power supply input	+16 V 2.5 A (supplied using a special AC adapter)
Evaluation MCU power supply	Emulator interface power supply output	+3.3 V or +5.0 V (supplied from the emulator)
	User system power supply input	+1.8 V to +5.5 V ^(*1) 10 mA or less ^(*2) (Dual source power supply supported: Supplied from the user system)
Operating frequency	High-speed I/F	8 KHz to 33 MHz ^(*3)
	Conventional interface	8 KHz to 20 MHz ^(*3)
Temperature	+5 to +35 degrees Celsius	
Humidity	20 to 80% (No condensation)	
External dimensions	148(W) x 210(D) mm x 44(H) (excluding protruding sections and rubber feet)	
Weight	700 g	

*1: The upper and lower voltage limits depend on the evaluation MCU used.

For more information, contact the Fujitsu Sales Dept. or Support Dept.

*2: The current consumption of the evaluation MCU is excluded.

*3: The upper and lower frequency limits depend on the evaluation MCU used. The upper and lower frequency limits may depend on the operating voltage, even if the same evaluation MCU is used. For more information, contact the Fujitsu Sales Dept. or Support Dept.

1.4 RS-232C Port Specifications

The emulator includes an RS-232C port.

■ RS-232C port specifications

Table 1.4-1 "RS-232C port specifications" lists the RS-232C port specifications, and Figure 1.4-1 "Pin assignment of the RS-232C connector" shows the pin assignment of the RS-232C connector.

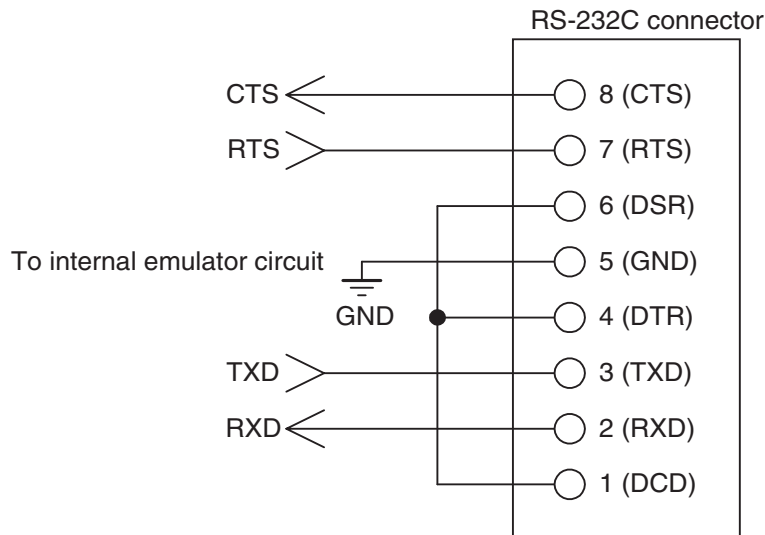
For information on Interlink cable connection, see Section 1.10 "Options".

Table 1.4-1 RS-232C port specifications

Item	Description
Connector shape	D-sub 9 pins (male)
Signal definition	DTE (same as the signal definition for personal computers)
Baud rate ^(*1)	9600, 19.2 K, 115.2 K [bps]
Data bit length	8 bits
Start bit length	1 bit
Stop bit length	1 bit
Parity bit	None
X control	None

*1: Baud rates depend on the emulator debugger specifications.
For details, see the *Softune Workbench Operation Manual*.

Figure 1.4-1 Pin assignment of the RS-232C connector



Note: The emulator uses pin assignments that do not use some signal lines, as shown above.

1.5 USB Port Specifications

The emulator includes a USB port.

■ USB port specifications

Table 1.5-1 "USB port specifications" lists the USB port specifications.

Table 1.5-1 USB port specifications

Item	Description
Standard compliance	USB 1.1
Communication mode	Full Speed Bulk Transfer
Data transfer rate	12 Mbps
Connector shape	Series B
Power supply	Self Powered

1.6 LAN Port Specifications

The emulator includes a LAN port.

■ LAN port specifications

Table 1.6-1 "LAN port specifications" lists the LAN port specifications.

Table 1.6-1 LAN port specifications

Item	Description
Standard compliance	IEEE 802.3
Communication mode	TCP/IP
Data transfer rate	10 Mbps/100 Mbps
Connector shape	Series B
IP address	Variable
Port address	Variable
Ethernet address	Global: Fixed address (registered in IEEE) Local: Variable address

1.7 External Trigger Input Terminal Specifications

The emulator has a TRIG terminal for input of external trigger signals.

External trigger input terminal specifications

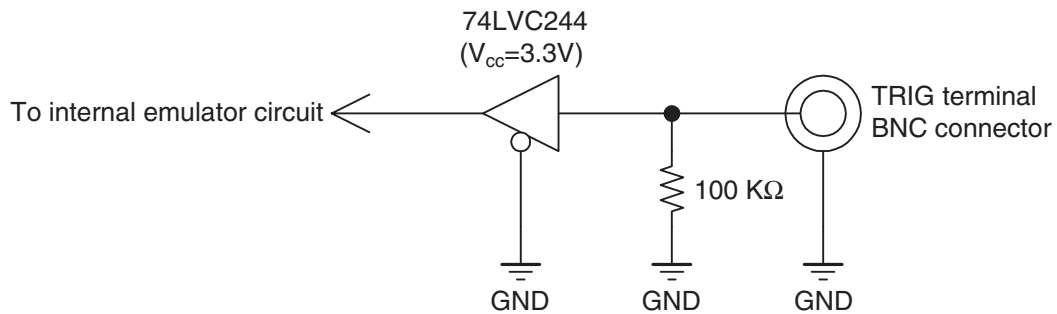
External trigger input is a function (external trigger break function) that is used to input a break signal from external test equipment, such as a logic analyzer connected to the emulator, to the evaluation MCU on the emulator.

Table 1.7-1 "External trigger input terminal specifications" lists the external trigger input terminal specifications, and Figure 1.7-1 "Configuration of the peripheral circuit for the external trigger input terminal" shows the corresponding peripheral circuit configuration.

Table 1.7-1 External trigger input terminal specifications

Terminal name	Input or output	Description
TRIG	Input	Used to input external trigger signals. This terminal is used for break function control. The active signal triggered by a transition from level L to H or that by a transition from level H to L can be selected. A break occurs at detection of the selected active signal that is input.

Figure 1.7-1 Configuration of the peripheral circuit for the external trigger input terminal



Precautions on use

Before using the external trigger function, read the following explanation on break slip so that you understand its characteristics.

Break slip

A trigger signal input via the external trigger input terminal is encoded in the emulator internal circuit into the emulator interface command code. The signal is then transmitted to the evaluation MCU in the emulator system. The emulator interface has lower clock frequency than that of the evaluation MCU (the ratio of these clock frequencies depends on the evaluation MCU used). Therefore, a relatively large break slip (in a range of dozens to hundreds of machine clock pulses) occurs between trigger signal input and the associated break operation of the evaluation MCU.

1.8 Program Execution Output Terminal Specifications

The emulator has an EMUL terminal that outputs program execution signals.

■ Program execution output terminal specifications

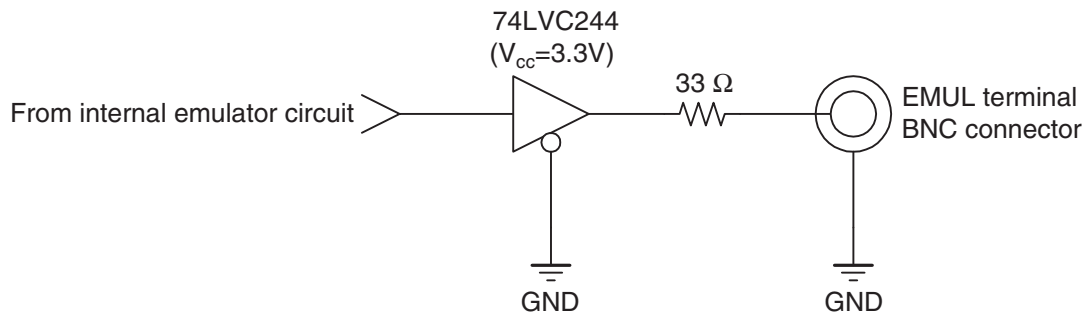
A program execution signal is output continuously while a user program is being executed.

Table 1.8-1 "Program execution output terminal specifications" lists the program execution output terminal specifications, and Figure 1.8-1 "Configuration of the peripheral circuit for the program execution output terminal" shows the corresponding peripheral circuit configuration.

Table 1.8-1 Program execution output terminal specifications

Terminal name	Input or output	Description
EMUL	Output	Outputs user program execution signals. An Level-H signal is output continuously while a user program is being executed.

Figure 1.8-1 Configuration of the peripheral circuit for the program execution output terminal



1.9 Power-On Debug Specifications

The emulator has a power-on debug function that executes a program immediately after power is turned on to the evaluation MCU.

■ Power-on debug specifications

The power-on debug function^(*1) verifies the processing of an executed program immediately after the power-on sequence by using the PLEV pin^(*2) of the evaluation MCU.

This function must be preset before it can be used.

For details about presetting the function, see the *Softune Workbench Operation Manual*.

*1: The power-on debug function is enabled if supported by the evaluation MCU.
Before using the function, consult the Fujitsu Sales Dept. or Support Dept.

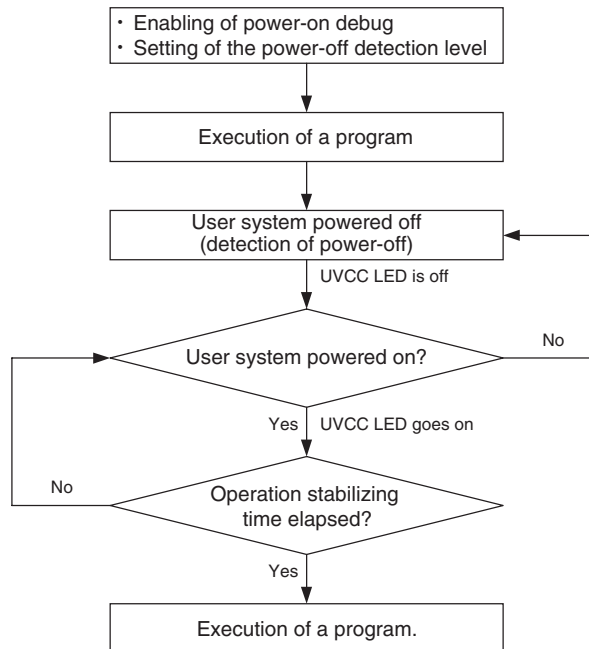
Sales Department or the Support Department of Fujitsu Limited.

*2: The PLEV pin name may depend on the evaluation MCU used.
Before using the function, consult the Fujitsu Sales Dept. or Support Dept.

■ Operational flow

Figure 1.9-1 "Flow of the power-on debug operation" shows the flow of the power-on debug operation.

Figure 1.9-1 Flow of the power-on debug operation



■ Operation outline

Figure 1.9-2 "Timing chart of the power-on debug operation" is a timing chart of the power-on debug operation.

○ Operation timing

Detection of power-off:

Power-off status of user system power supply voltage (UV_{CC}) is detected.

When the user power supply voltage becomes equal to or less than the power-off detection level, the emulator outputs an L-level signal to the PLEV pin of the evaluation MCU to stop the MCU and prevent its malfunction.

(See (1) in Figure 1.9-2 "Timing chart of the power-on debug operation".)

Detection of power-on:

The power-on status of user system power supply voltage (UV_{CC}) is detected.

Power-on of the user power supply (UV_{CC}) is detected.

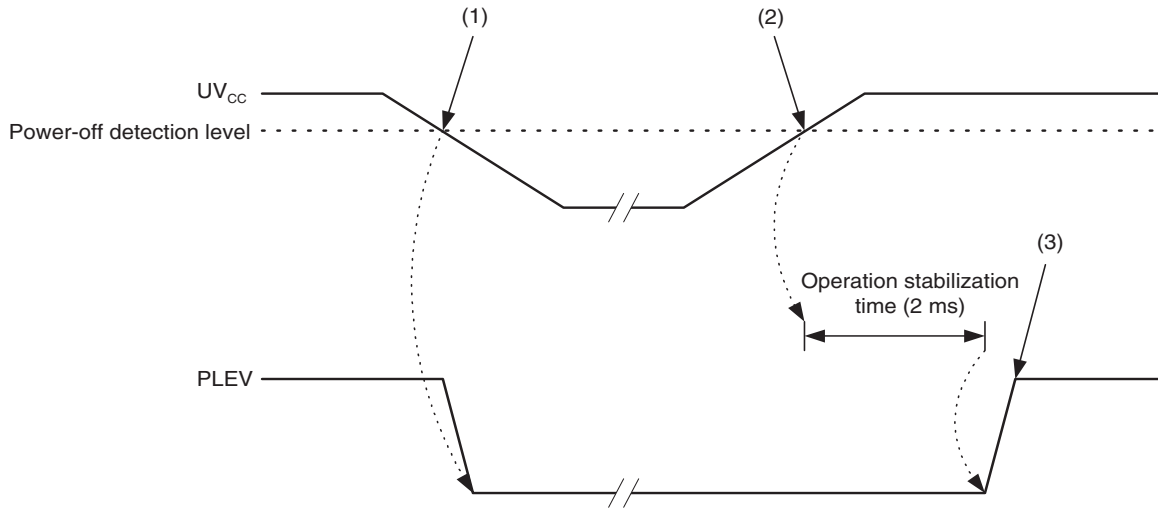
The function checks that a voltage higher than the power-off detection level is held for the operation stabilization time (about 2 ms) of the evaluation MCU after the voltage is detected as being higher than the power-off detection level.

(See (2) in Figure 1.9-2 "Timing chart of the power-on debug operation".)

After the operation stabilization time, the emulator outputs an H-level signal to the PLEV pin of the evaluation MCU and releases the user reset input for program execution.

(See (3) in Figure 1.9-2 "Timing chart of the power-on debug operation".)

Figure 1.9-2 Timing chart of the power-on debug operation



Notes:

Setting of the power-off detection level must take the characteristics of the user power supply (UV_{CC}) into consideration.

If using the power-on debug function, generally set the voltage about 5% above the minimum operation assurance voltage of the evaluation MCU. If not using the power-on debug function, set the voltage to the minimum operation assurance voltage of the evaluation MCU. While the PLEV pin level is low, the emulator functions (trace, event, and other) are disabled because the evaluation MCU blocks the emulator connection to prevent the emulator from malfunctioning.

1.10 Options

A variety of options are available for the emulator. Purchase options separately as necessary.

■ Options

The emulator unit cannot be used independently. Table 1.10-1 "Options" lists options for the emulator. As required, purchase options to build an emulator system suitable for the evaluation MCU used.

Table 1.10-1 Options

Name	Model name
Evaluation MCU ^(*1)	MB90Vxxx
Adapter board ^(*2)	MB2147-xx
Probe cable ^(*3)	MB2132-xxx
Probe header ^(*3)	MB2147-xxx
RS-232C cable ^{(*4)(*5)}	-
USB cable ^(*4)	-
LAN cable ^(*4)	-
BNC cable ^(*6)	-

*1: The model name depends on the evaluation MCU used. For more information, contact the Fujitsu Sales Dept. or Support Dept.

*2: The adapter board is an interface board that connects the user system to the emulator unit.

Purchase an adapter board that is compatible with the evaluation MCU used. Contact the Fujitsu Sales Dept. or Support Dept. for information on selecting a suitable adapter board. For information on how to handle and use an adapter board, and for related safety precautions, see the Adapter Board Hardware Manual.

*3: The probe cable is an FPC cable that connects the user system to the emulator.

The probe header is a board that uses a flat cable to connect the user system to the emulator.

Purchase a probe cable and header that are compatible with package of the regular-production MCU being used. Contact the Fujitsu Sales Dept. or Support Dept. for information on how to select a suitable probe cable and probe header.

For information on how to handle and use a probe cable and probe header, and for related safety precautions, see the respective operation manuals.

*4: Use an RS-232C, USB, or LAN cable for the communication interface. Prepare a cable that is compatible with both the emulator and the host machine used.

*5: Prepare an RS-232C cable by selecting a cross (interlink) type cable.

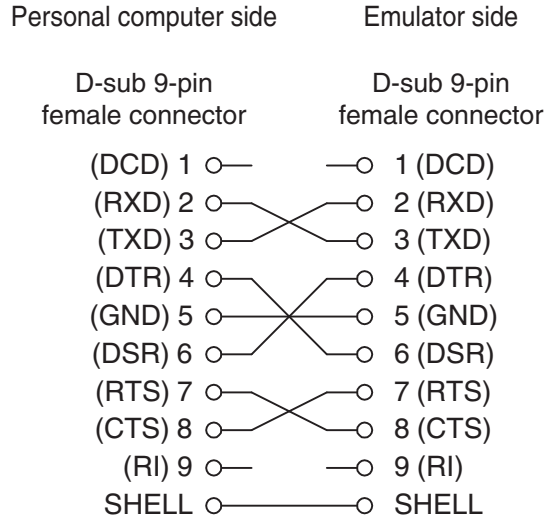
Figure 1.10-1 "Interlink cable wiring" shows interlink cable wiring.

*6: A BNC cable is required only if the TRIG or EMUL terminal in the emulator is used.

In a BNC cable is required, prepare one with an impedance of 50 ohms and a maximum length of 2 meters.

Prepare a BNC cable that is compatible with both the emulator and the device connected to the emulator.

Figure 1.10-1 Interlink cable wiring



1.11 Precautions about Possible Problems

If a problem occurs during use of the emulator, take action as described below.

■ Precautions about possible problems

WARNING

Plug



If the product emits excessive heat, smoke, an offensive smell, or an unusual noise, turn off power immediately. Then, disconnect the power plug from the outlet. If smoke was detected, make sure that no more smoke is coming from the product. Then, contact our sales or support department to request that the product be repaired. Do not attempt to repair the product by yourself. Otherwise, personal injury, damage to the product, or other property damage may result. Using such a product without having it properly repaired may result in fire or electric shock.

If water or other liquid, a metallic object, or other foreign matter enters the product, immediately turn off power, and disconnect the power plug from the outlet. Then, consult with our sales or support department. Using the product under such abnormal conditions may result in device problems, fire, or electric shock.

1.12 Precautions on Handling the Product

Follow the precautions described below when handling the emulator.

■ Precautions on handling the product

WARNING

Electric shock



Do not touch the inside of a connector port. Doing so may result in electric shock or device problems.

Plug



Disconnect the power plug during electrical storms. Using the product during an electrical storm may result in damage to the product or fire.

No disassembly



Do not open the product case. Do not modify the product without permission. Doing so may result in device problems, fire, or electric shock.

No moisture



Do not use the product near water such as near a bath or shower. Doing so may result in device problems, fire, or electric shock.

 **WARNING**

Prohibition



Do not touch the product with wet hands. Doing so may result in electric shock.

Do not place the product in a location exposed to excessive moisture or dust or in a poorly ventilated location. Do not place the product near an open flame. Doing so may result in device problems, fire, or electric shock.

Do not block the product ventilation holes. Doing so may cause generation of excessive heat, possibly resulting in a fire.

Do not insert metallic, combustible, or other objects or allow them to drop into the product through a ventilation hole or other opening. Doing so may result in device problems, fire, or electric shock.

Do not use a voltage other than the indicated value of supply voltage. Do not connect power cable together with too many plugs to an outlet. Doing so may result in fire or electric shock.

The product must not be scratched, modified, forcibly bent, pulled, twisted, or exposed to heat. Do not place heavy objects on the product. Doing so may result in device problems, fire, or electric shock.

 CAUTION

Plug



Disconnect the power plug before moving the product. Disconnect all other connected cables. Exercise caution when working near cables on the floor. Damage to a cable may result in fire or electric shock. A falling device may result in injury.

If the product is not to be used for an extended period, disconnect the power plug. Doing so may result in fire or electric shock.

Prohibition



Do not place the product in a location exposed to shock or a location that is not level or stable. Doing so may result in device problems or the product falling over or falling on the floor.

Do not grasp the cable when unplugging the power plug and cable. Always grasp the power plug or connector itself. Pulling the cable may expose conductors or sever wires in it, possibly resulting in device problems, fire, or electric shock.

Do not place the product in a location, such as near a speaker or television tuner, where it is exposed to an electromagnetic field. Doing so may result in device problems.

Attention



Insert the power plug so that the connection is secure. Doing so may result in device problems or fire.

1.13 Precautions on Use

Follow the precautions described below when using the emulator.

■ Precautions on use

WARNING

Prohibition



Do not use the product if it has a fault, damage, or severed wires in the cable. Doing so may result in fire or electric shock.

Do not block the product ventilation holes. Doing so may cause generation of excessive heat, possibly resulting in a fire.

CAUTION

Prohibition



Make sure that power to the product is turned off and the power plug is disconnected from outlets before connecting or disconnecting cables, removing or mounting boards, handling switches or jumpers, or mounting parts (unless such an operation uses USB cables for plug-and-play devices). Doing so may result in device problems or electric shock.

Do not grasp the cable when unplugging the power plug and cable. Always grasp the power plug or connector itself. Pulling the cable may expose conductors or severed wires in it, possibly resulting in device problems, fire, or electric shock.

To prevent device damage by electrostatic discharge, do not touch, and do not let any object contact pins of connectors or other parts of the product. Before handling the product, be sure to discharge static electricity from your body by touching a metallic object, such as a doorknob. Doing so may result in device problems.

Note:

Follow the instructions in this manual to set up and use the emulator.

■ Precautions on storage




<p>Prohibition</p> 	<p>Do not apply any shock to this product. Doing so may result in device problems.</p>
	<p>Do not expose the product to direct sunlight, and do not place it where it is hot and humid. Do not allow condensation to form on the product.</p>
	<p>Do not store the product in a dusty location. Doing so may result in device problems.</p>
	<p>Do not store the product where it is exposed for a long time to relatively strong electric or magnetic fields. Because the product uses many electronic components, problems may result.</p>

Table 1.13-1 "Standard temperatures and relative humidity levels of emulator operation and storage" lists the standard temperatures and relative humidity levels of emulator operation and storage.

Table 1.13-1 Standard temperatures and relative humidity levels of emulator operation and storage

	Temperature	Relative humidity
Operation	+5 to +35 degrees Celsius	30 to 80% (without condensation)
Storage	0 to +70 degrees Celsius	20 to 90% (without condensation)

CHAPTER 2 CONNECTING THE EMULATOR

This chapter explains how to connect the emulator. Read this chapter before turning on the emulator.

- 2.1 "System Configuration"
- 2.2 "Connecting an Adapter Board"
- 2.3 "Connecting the User System"
- 2.4 "Connecting a Probe"
- 2.5 "Connecting a Host Machine"
- 2.6 "Connecting Test Equipment"
- 2.7 "Connecting the AC Adapter"

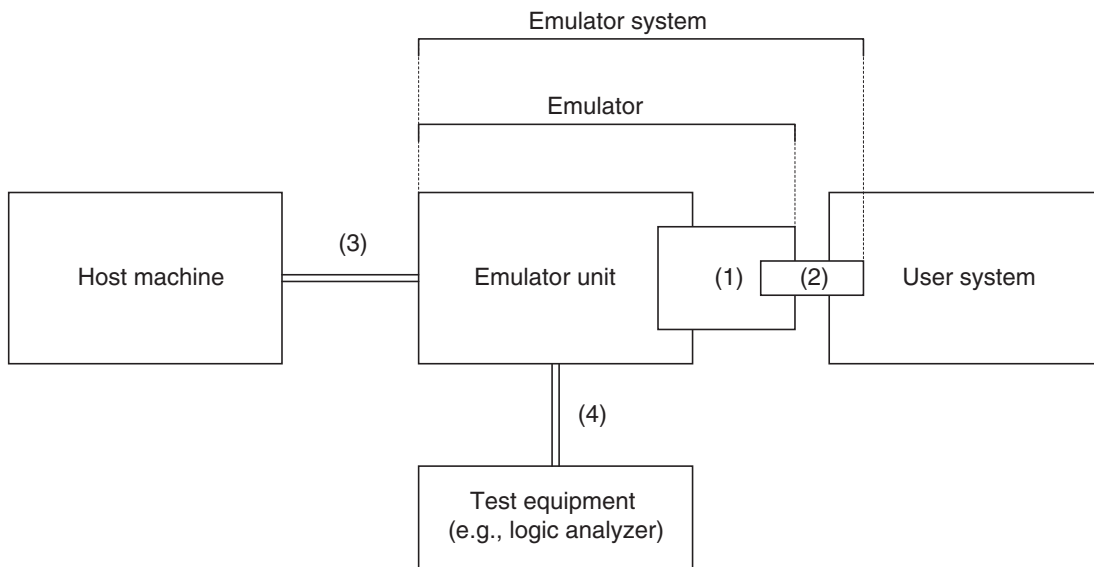
2.1 System Configuration

The emulator is designed to be connected to and controlled by a host machine. The host machine uses emulator debugger software to control the emulator. See the *Softune Workbench Operation Manual* for information on how to use the software.

■ System configuration

Figure 2.1-1 "System configuration" shows the emulator system configuration.

Figure 2.1-1 System configuration



- (1) Adapter board^(*)
- (2) Probe
Probe cable^(*), flat cable, or flat cable + probe header^(*)
- (3) RS-232C cable^(*), USB cable^(*), or LAN cable^(*)
- (4) BNC cable^(*)

*1: To be prepared separately

2.2 Connecting an Adapter Board

Insert an adapter board (option) into the adapter board connector at the top of the emulator unit, as shown in Figure 2.2-1 "Connecting the adapter board".

■ Connecting an adapter board

⚠ CAUTION

Prohibition

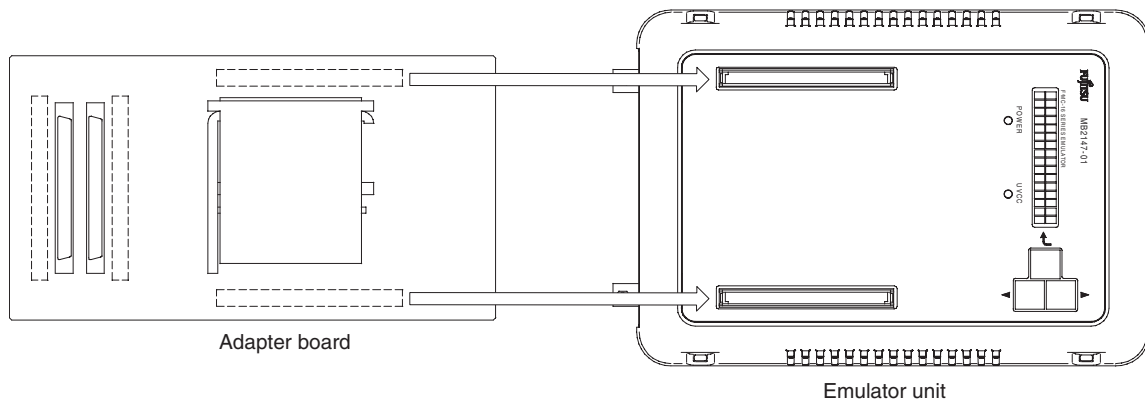


Make sure that power to the product is turned off and the power plug is disconnected from outlet before removing or mounting boards. Doing so may result in device problems or electric shock.

When mounting a board, make sure that it is mounted in the proper direction. Doing so may result in device problems.

Do not apply pressure on one part of a board when mounting the board. Attempt to distribute equal pressure on the entire board. Doing so may result in damage to the board.

Figure 2.2-1 Connecting the adapter board



2.3 Connecting the User System

Connect a probe to the user system.

■ Connecting the user system

Connect a probe to the user system.

The method of connecting a probe to the user system depends on the probe configuration. Table 2.3-1 "Probe configurations" summarizes the applicable probe configurations.

Table 2.3-1 Probe configurations

Cable used	Probe configuration	Connection to user system
Probe cable	Probe cable	Insert the connector ^(*1) of the probe cable header into the appropriate connector ^(*1) of the user system.
Flat cable	Flat cable and probe header	Insert the connector ^(*1) of the probe header into the appropriate connector ^(*1) of the user system.
	Flat cable	Connect the connector of the flat cable to the connector of the user system.

*1: The shape of the header connector depends on the model of header.

Example: IC socket and NQPACK connector

Note:

Before connecting the adapter board to the user system using a probe, remove the regular-production MCU from the user system.

■ Connecting (using a probe cable) to the user system

CAUTION

Prohibition



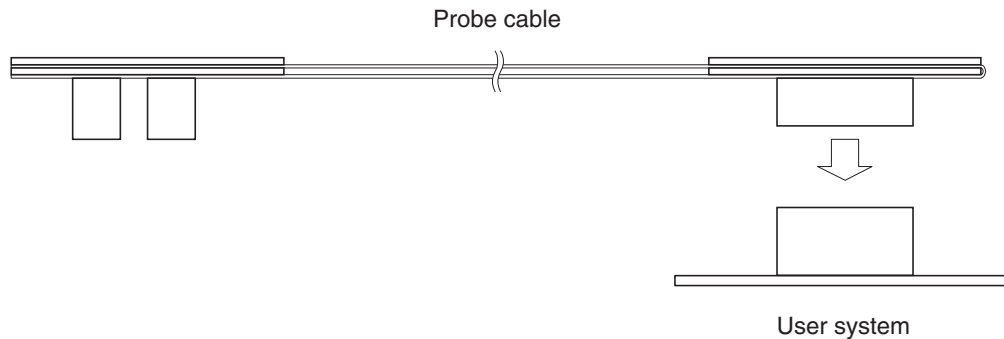
Make sure that power to the product is turned off and the power plug is disconnected from outlets before connecting or disconnecting cables. Doing so may result in device problems or electric shock.

Do not grasp the cable when unplugging the power plug and cable. Always grasp the power plug or connector itself. Pulling the cable may expose conductors or sever wires in it, possibly resulting in device problems, fire, or electric shock.

With a probe cable compatible with the package of the regular-production MCU being used, connect the cable to the appropriate connector of the user system, as shown in Figure 2.3-1 "Connecting (using a probe cable) to the user system".

For more information on how to connect the connector of the probe cable header, see the operation manual of the probe cable used.

Figure 2.3-1 Connecting (using a probe cable) to the user system



■ Connecting (using flat cables and a probe header) to the user system

CAUTION

Prohibition



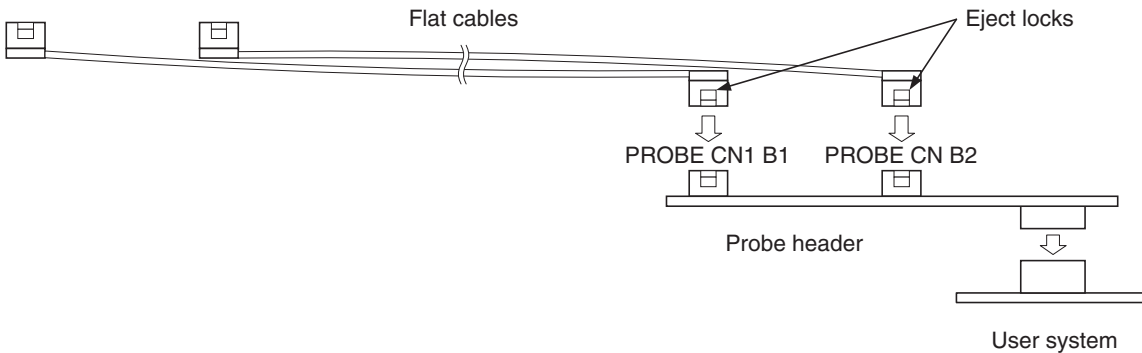
Make sure that power to the product is turned off and the power plug is disconnected from outlets before connecting or disconnecting cables. Doing so may result in device problems or electric shock.

Do not grasp the cable when unplugging the power plug and cable. Always grasp the power plug or connector itself. Pulling the cable may expose conductors or sever wires in it, possibly resulting in device problems, fire, or electric shock.

With a probe header compatible with the package of the regular-production MCU being used, connect the probe header to the appropriate connector of the user system, as shown in Figure 2.3-2 "Connecting (using flat cables and a probe header) to the user system".

For more information on how to connect the connector of the probe header, see the operation manual of the probe header used.

Figure 2.3-2 Connecting (using flat cables and a probe header) to the user system



To connect a flat cable, push its connector into the connector of the probe header until the eject locks on both sides of the flat cable connector lock.

To disconnect a flat cable, pinch the eject locks on both sides of the flat cable connector until the flat cable unlocks, and pull out the connector.

■ Connecting (using flat cables) to the user system

⚠ CAUTION

Prohibition



Make sure that power to the product is turned off and the power plug is disconnected from outlets before connecting or disconnecting cables. Doing so may result in device problems or electric shock.

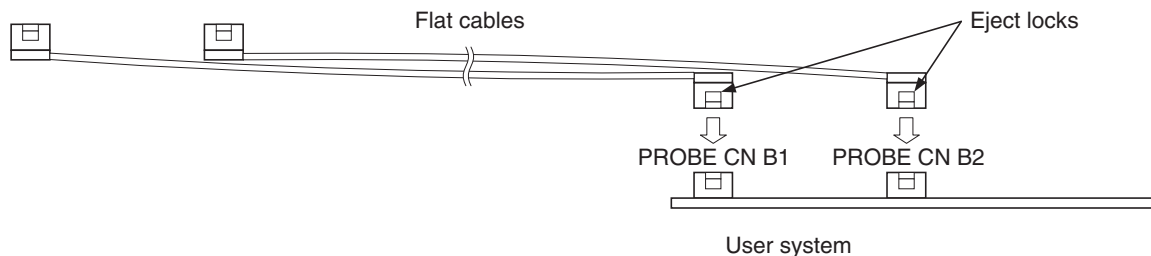
Do not grasp the cable when unplugging the power plug and cable. Always grasp the power plug or connector itself. Pulling the cable may expose conductors or sever wires in it, possibly resulting in device problems, fire, or electric shock.

If connectors that are mates of probe connectors B1 and B2 of the adapter board are mounted in the user system, the user system can be connected to the adapter board via flat cables.

For the interface specifications of probe connector B1 and B2, see the Adapter Board Hardware Manual.

Connect flat cables to the probe connector B1 and B2 in the user system, as shown in Figure 2.3-3 "Connecting (using flat cables) to the user system".

Figure 2.3-3 Connecting (using flat cables) to the user system



To connect a flat cable, push its connector into probe connector B1 or B2 until the eject locks on both sides of the flat cable connector lock.

To disconnect a flat cable, pinch the eject locks on both sides of the flat cable connector until the flat cable unlocks, and pull out the connector.

2.4 Connecting a Probe

Connect a probe to the adapter board.

■ Connecting a probe

Note:

The adapter board has two pairs of probe connectors. Do not use both pairs at the same time. Use only one of these pairs according to the configuration of the probe used.

■ Connecting a probe (using a probe cable)



Prohibition

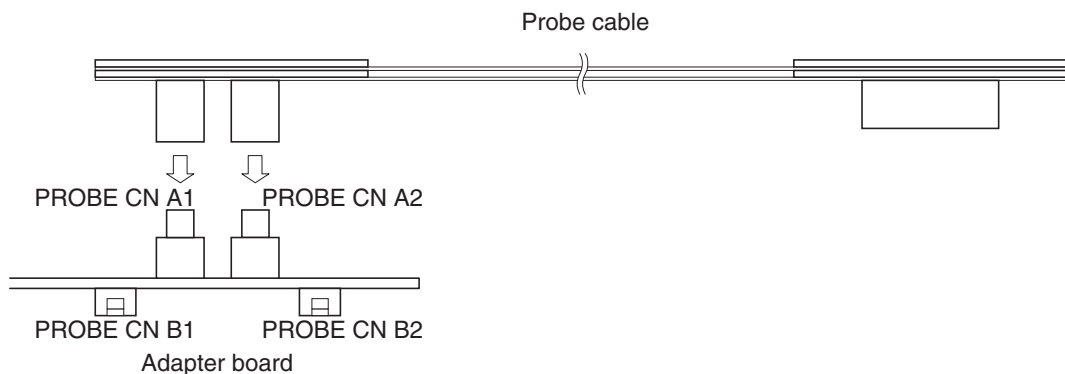


Make sure that power to the product is turned off and the power plug is disconnected from outlets before connecting or disconnecting cables. Doing so may result in device problems or electric shock.

Do not grasp the cable when unplugging the power plug and cable. Always grasp the power plug or connector itself. Pulling the cable may expose conductors or sever wires in it, possibly resulting in device problems, fire, or electric shock.

Connect a probe cable to probe connectors A1 and A2 on the adapter board, as shown in Figure 2.4-1 "Connecting a probe (using a probe cable)".

Figure 2.4-1 Connecting a probe (using a probe cable)



■ Connecting a probe (using flat cables)

⚠ CAUTION

Prohibition

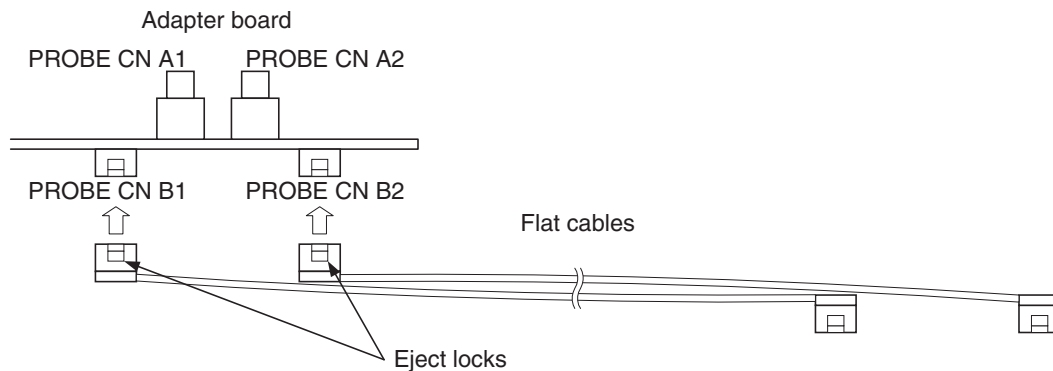


Make sure that power to the product is turned off and the power plug is disconnected from outlets before connecting or disconnecting cables. Doing so may result in device problems or electric shock.

Do not grasp the cable when unplugging the power plug and cable. Always grasp the power plug or connector itself. Pulling the cable may expose conductors or sever wires in it, possibly resulting in device problems, fire, or electric shock.

Connect flat cables to probe connectors B1 and B2 on the adapter board, as shown in Figure 2.4-2 "Connecting a probe (using flat cables)".

Figure 2.4-2 Connecting a probe (using flat cables)



To connect a flat cable, push its connector into probe connector B1 or B2 until the eject locks on both sides of the flat cable connector lock.

To disconnect a flat cable, pinch the eject locks on both sides of the flat cable connector until the flat cable unlocks, and pull out the connector.

2.5 Connecting a Host Machine

Connect a host machine to the emulator by using an RS-232C, USB, or LAN cable, as shown in Figure 2.5-1 "Connecting a host machine".

For a Plug & Play connection with a USB cable to a host machine, power on all relevant equipment, and then insert the USB cable plug for the host machine into the appropriate host machine socket.

■ Connecting a host machine

⚠ CAUTION

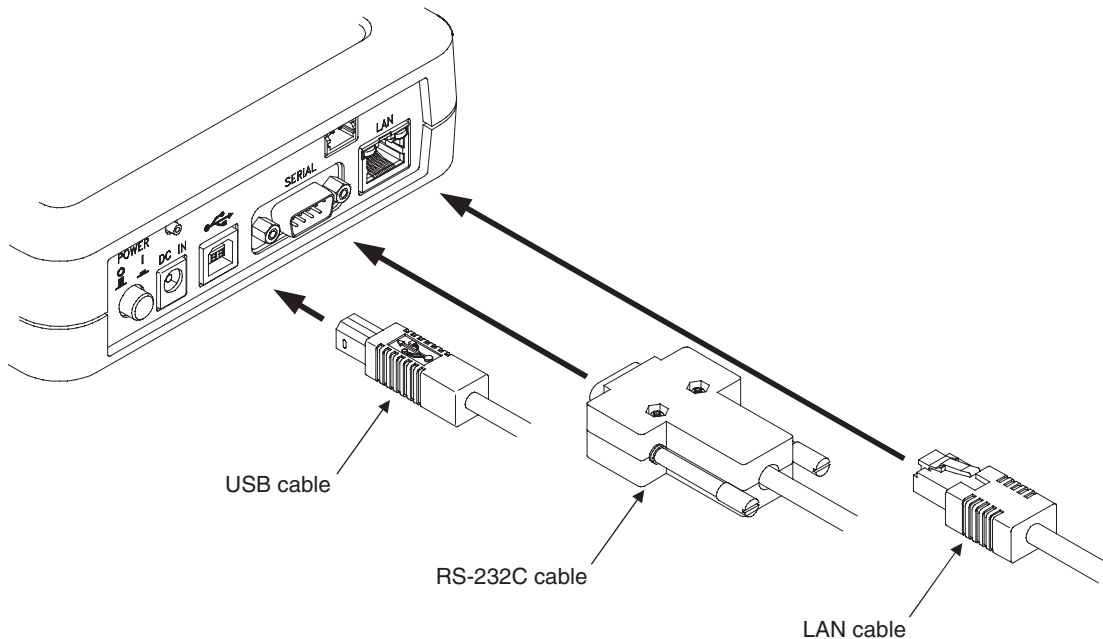
Prohibition



Make sure that power to the product is turned off and the power plug is disconnected from outlets before connecting or disconnecting cables (unless such an operation uses USB cables for plug-and-play devices). Doing so may result in device problems or electric shock.

Do not grasp the cable when unplugging the power plug and cable. Always grasp the power plug or connector itself. Pulling the cable may expose conductors or sever wires in it, possibly resulting in device problems, fire, or electric shock.

Figure 2.5-1 Connecting a host machine



Note:

Connect only one RS-232C, USB, or LAN cable between a host machine and the emulator. Connecting multiple communication cables between them may result in abnormal operation.

2.6 Connecting Test Equipment

Connect test equipment to the emulator, as shown in Figure 2.6-1 "Connecting test equipment", only if the external trigger input and program execution functions of the emulator are to be used. If these functions are not used, do not connect the TRIG and EMUL terminals.

■ Connecting test equipment

⚠ CAUTION

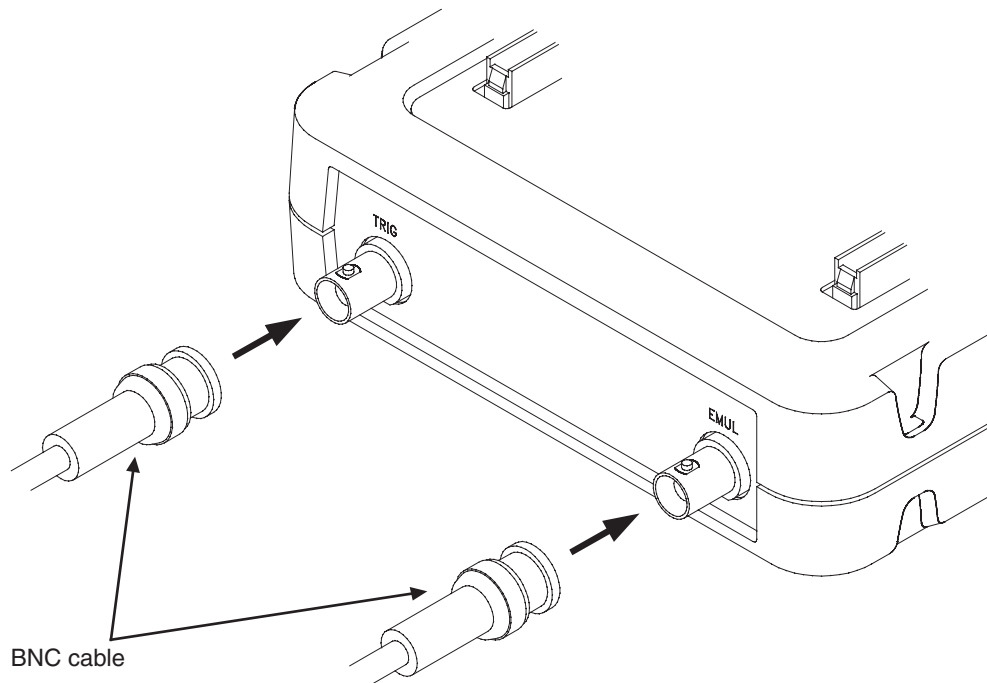
Prohibition



Make sure that power to the product is turned off and the power plug is disconnected from outlets before connecting or disconnecting cables. Doing so may result in device problems or electric shock.

Do not grasp the cable when unplugging the power plug and cable. Always grasp the power plug or connector itself. Pulling the cable may expose conductors or sever wires in it, possibly resulting in device problems, fire, or electric shock.

Figure 2.6-1 Connecting test equipment



2.7 Connecting the AC Adapter

Connect the AC adapter to the emulator, as shown in Figure 2.7-1 "Connecting the AC adapter".

First, insert the AC cord into the AC adapter. Next, connect the AC adapter to the emulator. Lastly, insert the AC plug into an AC outlet.

■ Connecting the AC adapter

⚠ CAUTION

Attention



Insert the power plug so that the connection is secure. Doing so may result in device problems or fire.

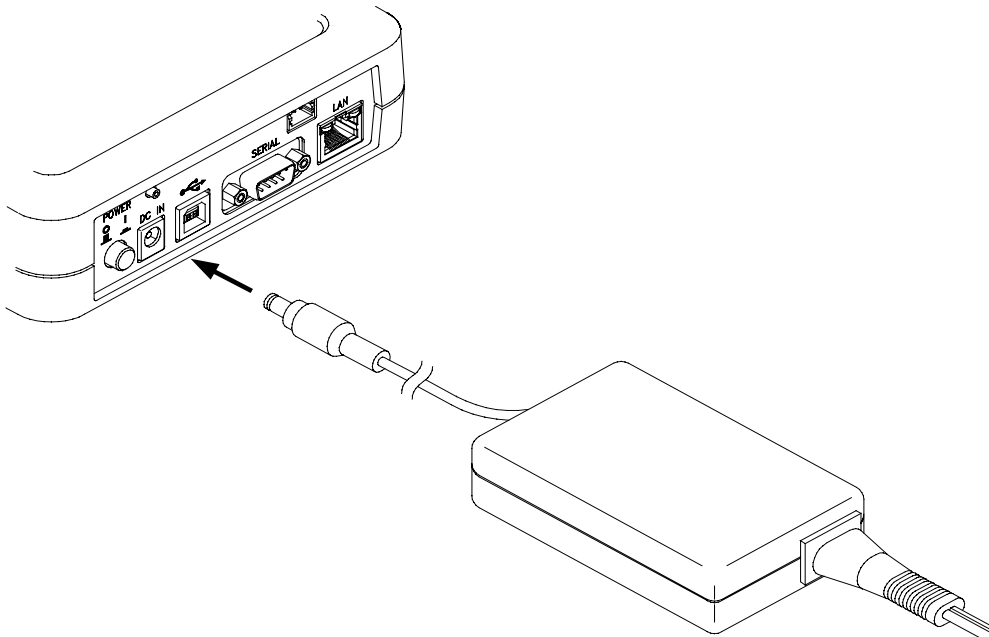
Prohibition



Make sure that power to the product is turned off and the power plug is disconnected from outlets before connecting or disconnecting cables. Doing so may result in device problems or electric shock.

Do not grasp the cable when unplugging the power plug and cable. Always grasp the power plug or connector itself. Pulling the cable may expose conductors or sever wires in it, possibly resulting in device problems, fire, or electric shock.

Figure 2.7-1 Connecting the AC adapter



CHAPTER 3 OPERATING THE EMULATOR

This chapter explains basic operations of the emulator. Read this chapter before turning on the emulator.

For details about the adapter board, see the Adapter Board Hardware Manual.

- 3.1 "Mounting an Evaluation MCU"
- 3.2 "Clock Supply"
- 3.3 "Emulator-dedicated Power Supply Switching"
- 3.4 "User Port Power Supply Switching"
- 3.5 "Switching the C Pin Setting"
- 3.6 "User Data Bus Switching"
- 3.7 "Using the Setting Switches"
- 3.8 "Power-On Sequence"
- 3.9 "Power-Off Sequence"

3.1 Mounting an Evaluation MCU

Mount an evaluation MCU on the emulator.

■ Mounting an evaluation MCU



Prohibition

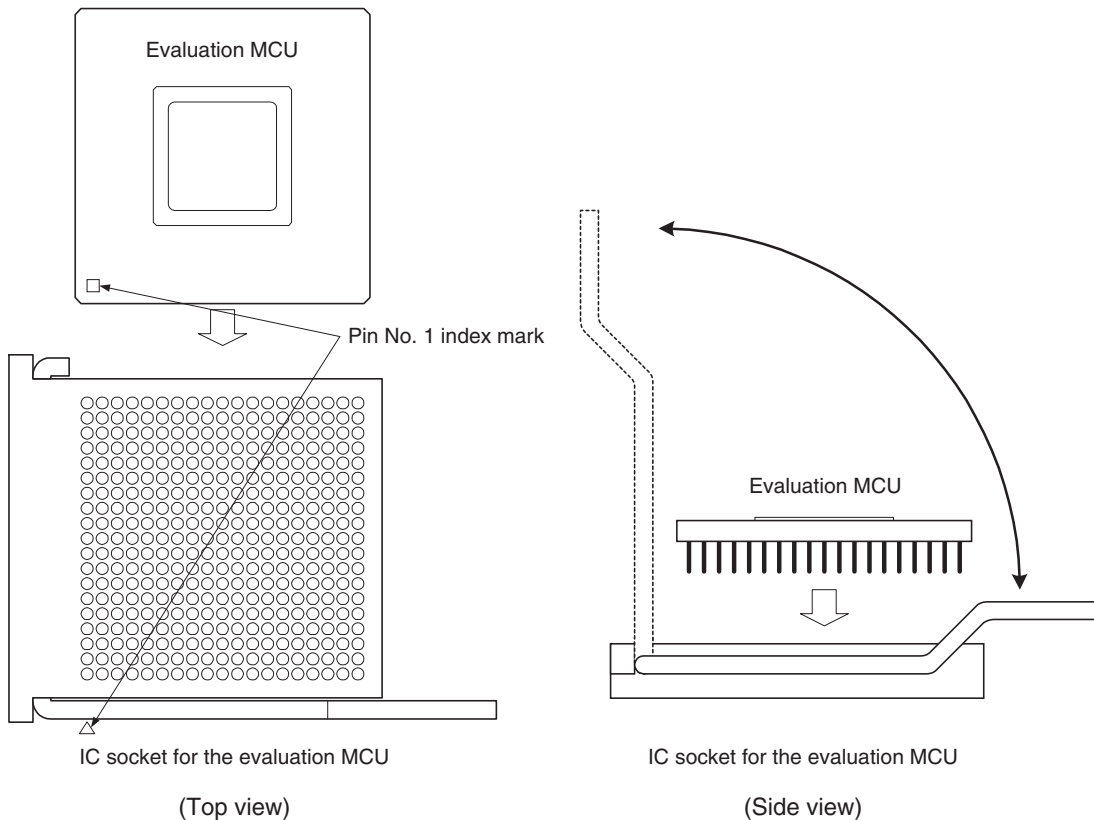


Make sure that power to the product is turned off and the power plug is disconnected from outlets before mounting the evaluation MCU. Doing so may result in device problems or electric shock.

Pull the lever of an IC socket for an evaluation MCU on the emulator, and mount the evaluation MCU while aligning the pin No. 1 index mark (□ or ○) of the evaluation MCU with that (△) of the IC socket.

After mounting the evaluation MCU, push the lever of the IC socket back to its original position.

Figure 3.1-1 Mounting an evaluation MCU



3.2 Clock Supply

This section explains clock supply to the evaluation MCU.

■ Clock supply

⚠ CAUTION

Prohibition



Make sure that power to the product is turned off and the power plug is disconnected from outlets before mounting crystal unit or handling switches or jumpers. Doing so may result in device problems or electric shock.

The emulator supplies clock pulses to the evaluation MCU.

Figure 3.2-1 "Mounting a crystal unit" shows how to mount a crystal unit in IC sockets for a crystal unit on the emulator. Figure 3.2-2 "Configuration of peripheral circuits for the clock circuit" shows the configuration of peripheral circuits for the clock circuit. Figure 3.2-3 "Examples of jumper settings for subclock selection" shows examples of jumper settings for subclock selection. Table 3.2-1 "Settings for main clock selection" lists settings of main clock selection switches. Table 3.2-2 "Settings for subclock selection" lists settings for subclock selection.

Figure 3.2-1 Mounting a crystal unit

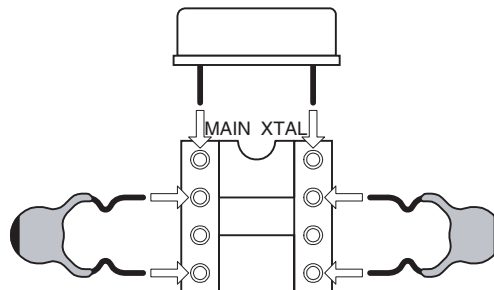


Figure 3.2-2 Configuration of peripheral circuits for the clock circuit

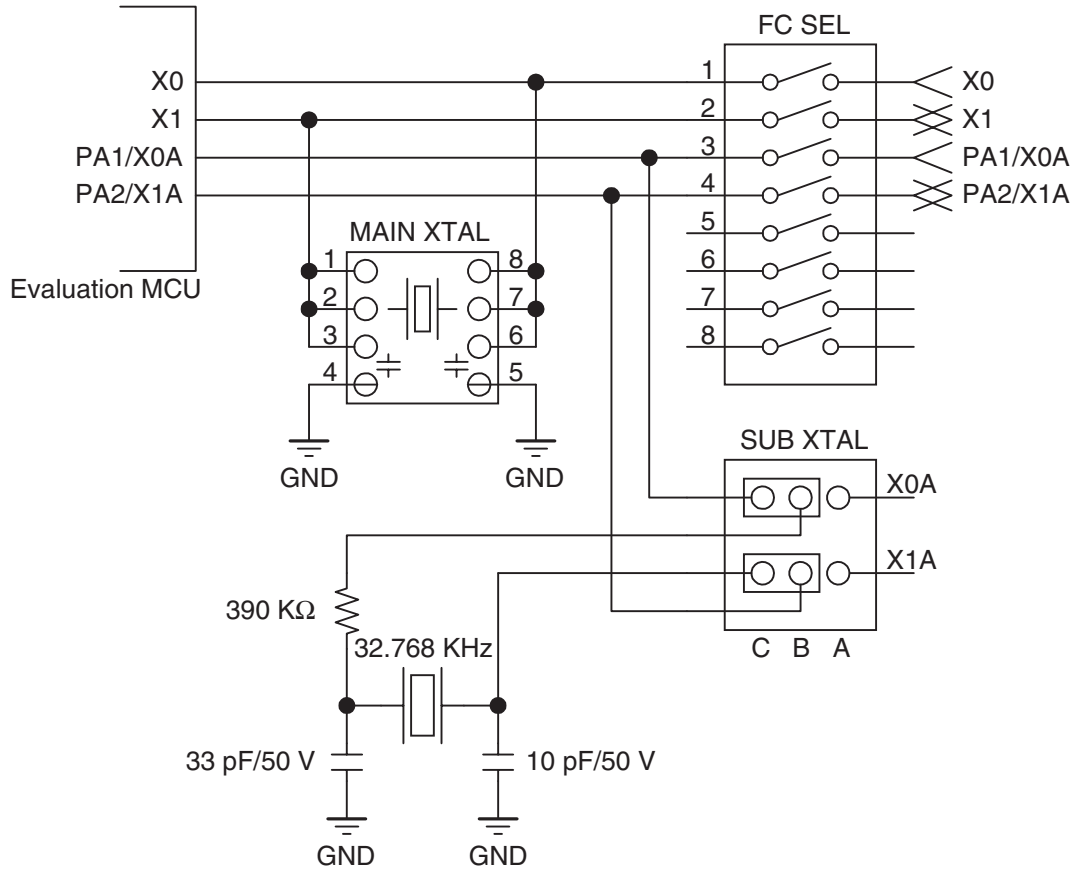


Figure 3.2-3 Examples of jumper settings for subclock selection

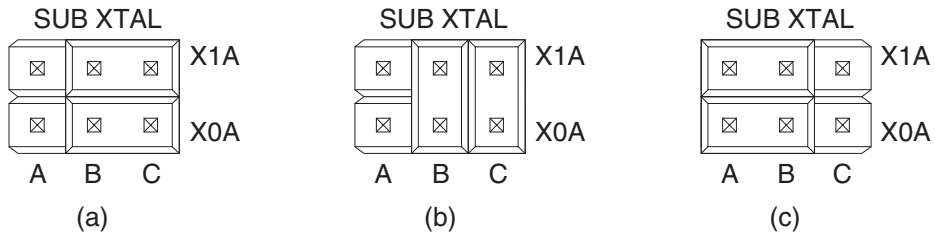


Table 3.2-1 Settings for main clock selection

Main clock source	FC SEL setting	
	1	2
Clock area	OFF	OFF
User system	ON	ON

Table 3.2-2 Settings for subclock selection

Subclock				FC SEL setting		SUB XTAL setting	
Availability	Source(*1)	Pin corresponding to the evaluation MCU(*2)		3	4		
Available	Clock area	PGA 299	X1A: Pin No. 267 X0A: Pin No. 217	OFF	OFF	X1A:B connected to X1A:C (a) in Figure 3.2-3	X0A:B connected to X0A:C (a) in Figure 3.2-3
			X1A: Pin No. 217 X0A: Pin No. 267	OFF	OFF	X1A:B connected to X0A:B (b) in Figure 3.2-3	X1A:C connected to X0A:C (b) in Figure 3.2-3
		PGA 256	X1A: Pin No. 51 X0A: Pin No. 176	OFF	OFF	X1A:B connected to X1A:C (a) in Figure 3.2-3	X0A:B connected to X0A:C (a) in Figure 3.2-3
			X1A: Pin No. 176 X0A: Pin No. 51	OFF	OFF	X1A:B connected to X0A:B (b) in Figure 3.2-3	X1A:C connected to X0A:C (b) in Figure 3.2-3
Not available	-	-	-	ON	ON	X1A:A connected to X1A:B (c) in Figure 3.2-3	X0A:A connected to X0A:B (c) in Figure 3.2-3

*1: Clock oscillation with a crystal unit mounted in the user system is not supported.

*2: In the table, PGA299 and PGA256 indicate different adapter boards, which are:

PGA299: Adapter board for the PGA-299P

PGA256: Adapter board for the PGA-256P

The correspondence between subclock signals (X0A and X1A) and pin numbers on the evaluation MCU depends on the evaluation MCU used. Check the correspondence before making settings.

For more information on the correspondence between subclock signals and pin numbers on the evaluation MCU, contact the Fujitsu Sales Dept. or Support Dept.

Note:


To supply the main clock signal from the user system, add an oscillation circuit to the user system and have the main clock supplied via a CMOS buffer.

3.3 Emulator-dedicated Power Supply Switching

According to whether the emulator-dedicated power supply on the evaluation MCU is available to be used, set switching of the emulator-dedicated power supply.

■ Switching of the emulator-dedicated power supply



<p>Prohibition</p> 	<p>Make sure that power to the product is turned off and the power plug is disconnected from outlets before handling jumpers. Doing so may result in device problems or electric shock.</p>
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Using the emulator-dedicated power supply switching jumper on the emulator, set the tool interface power supply on the evaluation MCU to operate with the user power supply (UV_{CC1}) or the development tool power supply (+5 V).

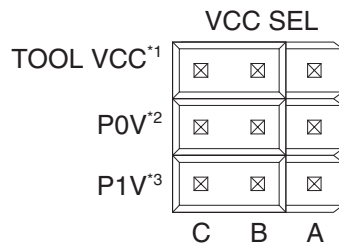
On an evaluation MCU that has a emulator-dedicated power supply, the development tool power supply must supply power to the evaluation MCU as a tool interface power supply.

Set the development tool power supply (+5 V) on such an evaluation MCU. On an evaluation MCU that does not have a emulator-dedicated power supply, set the user power supply (UV_{CC1}).

For details about an evaluation MCU with a emulator-dedicated power supply, see the Evaluation MCU Hardware Manual of the relevant product, or contact the Fujitsu Sales Dept. or Support Dept.

Figure 3.3-1 "Emulator-dedicated power supply switching jumper" shows the emulator-dedicated power supply switching jumper. Table 3.3-1 "Settings of the emulator-dedicated power supply switching jumper" lists the settings of the jumper.

Figure 3.3-1 Emulator-dedicated power supply switching jumper



- *1: Emulator-dedicated power supply switching jumper
- *2: Power supply switching jumper of user port 0 (For details, see Section 3.4 "User Port Power Supply Switching.")
- *3: Power supply switching jumper of user port 1 (For details, see Section 3.4 "User Port Power Supply Switching.")

Table 3.3-1 Settings of the emulator-dedicated power supply switching jumper

Emulator-dedicated power supply pin	Setting of VCC SEL (S1)
Available	TOOL VCC: B-C connected (+5 V)
Not available	TOOL VCC: A-B connected (UV_{CC1})

3.4 User Port Power Supply Switching

Select a user port power supply for the evaluation MCU.

■ Switching of the user port power supply



<p>Prohibition</p>	<p>Make sure that power to the product is turned off and the power plug is disconnected from outlets before handling jumpers. Doing so may result in device problems or electric shock.</p>
---------------------------	---

On the emulator, use the jumper for switching the user port power supply to set the reference voltage of the user data bus probing circuit.

The user data bus for which the reference voltage is set corresponds to user ports 0 and 1. Set the user port reference voltage for each port power supply source.

For details on the user data bus probing circuit, see Section 3.6 "User Data Bus Switching."

UV_{CC1}: Main power supply for the evaluation MCU

UV_{CC2}: Secondary power supply for the evaluation MCU

Table 3.4-1 "Settings of the jumper for switching the user port power supply" lists settings of the jumper for switching the user port power supply.

Table 3.4-1 Settings of the jumper for switching the user port power supply

User system power supply source	VCC SEL setting			
	Jumper for selecting user port 0 power supply (P0V) ^(*1)		Jumper for selecting user port 1 power supply (P1V) ^(*1)	
Single source	A connected to B (UV _{CC1} setting)		A connected to B (UV _{CC1} setting)	
Dual source	Jumper connection on target power supply side ^(*2)		Jumper connection on target power supply side ^(*2)	
	A connected to B (UV _{CC1} setting)	B connected to C (UV _{CC2} setting)	A connected to B (UV _{CC1} setting)	B connected to C (UV _{CC2} setting)

*1: See Figure 3.3-1 "Emulator-dedicated power supply switching jumper" for positions of the jumper for switching the user port power supply.

*2: Set a jumper connection to select the VCC that corresponds to a user port power supply.

Example: User port 0 power supply is UV_{CC1}, and user port 1 power supply is UV_{CC2}:

Jumper for selecting user port 0 power supply (P0V): Connect A to B (UV_{CC1} setting).

Jumper for selecting user port 1 power supply (P1V): Connect B to C (UV_{CC2} setting).

3.5 Switching the C Pin Setting

Set the setting of the C-pin selection switch according to whether the evaluation MCU has the C-pin.

■ Switching the C-pin setting

⚠ CAUTION

Prohibition



Make sure that power to the product is turned off and the power plug is disconnected from outlets before handling switches. Doing so may result in device problems or electric shock.

On the emulator, use the C-pin selection switch to set the C-pin setting.

Figure 3.5-1 "Configuration of the peripheral circuit for C-pin selection switch" shows the configuration of the peripheral circuit for the C-pin selection switch. Table 3.5-1 "Settings of the C-pin selection switch" lists the switch settings.

Figure 3.5-1 Configuration of the peripheral circuit for C-pin selection switch

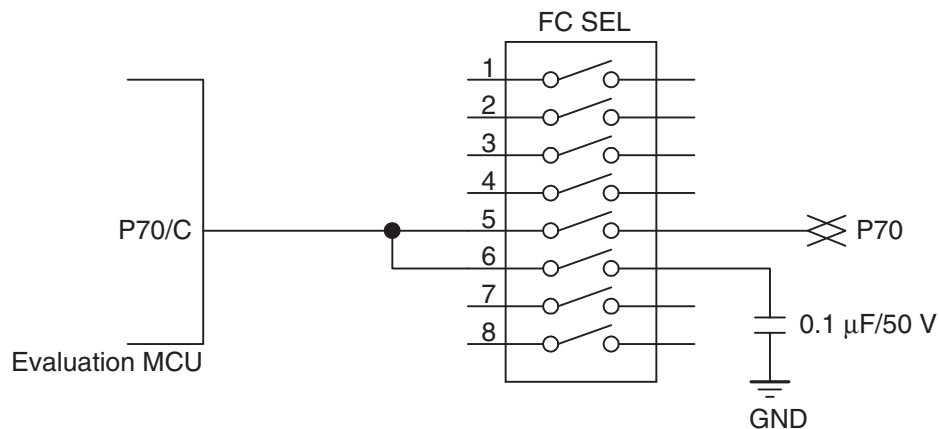


Table 3.5-1 Settings of the C-pin selection switch


C-pin	FC SEL setting	
	5	6
Available	OFF	ON
Not available	ON	OFF

3.6 User Data Bus Switching

Set the setting of the user data bus selection switch.

■ Switching of the user data bus



<p>Prohibition</p> 	<p>Make sure that power to the product is turned off and the power plug is disconnected from outlets before handling switches. Doing so may result in device problems or electric shock.</p>
---	--

If probing target pins (P00 to P07 and P10 to P17) have special specifications, such as for high-voltage ports, the user data bus probing circuit must be set to the disconnected status.

When the external bus of the evaluation MCU is not used, the disconnected status is the recommended setting for the user data bus probing circuit.

Using the user data bus selection switch on the emulator, set the user data bus probing circuit to the connected or disconnected status.

Figure 3.6-1 "Configuration of the peripheral circuit for the user data bus selection switch" shows the configuration of the peripheral circuit for the user data bus selection switch. Table 3.6-1 "Settings of user data bus selection switch" lists switch settings.

Table 3.6-1 Settings of user data bus selection switch

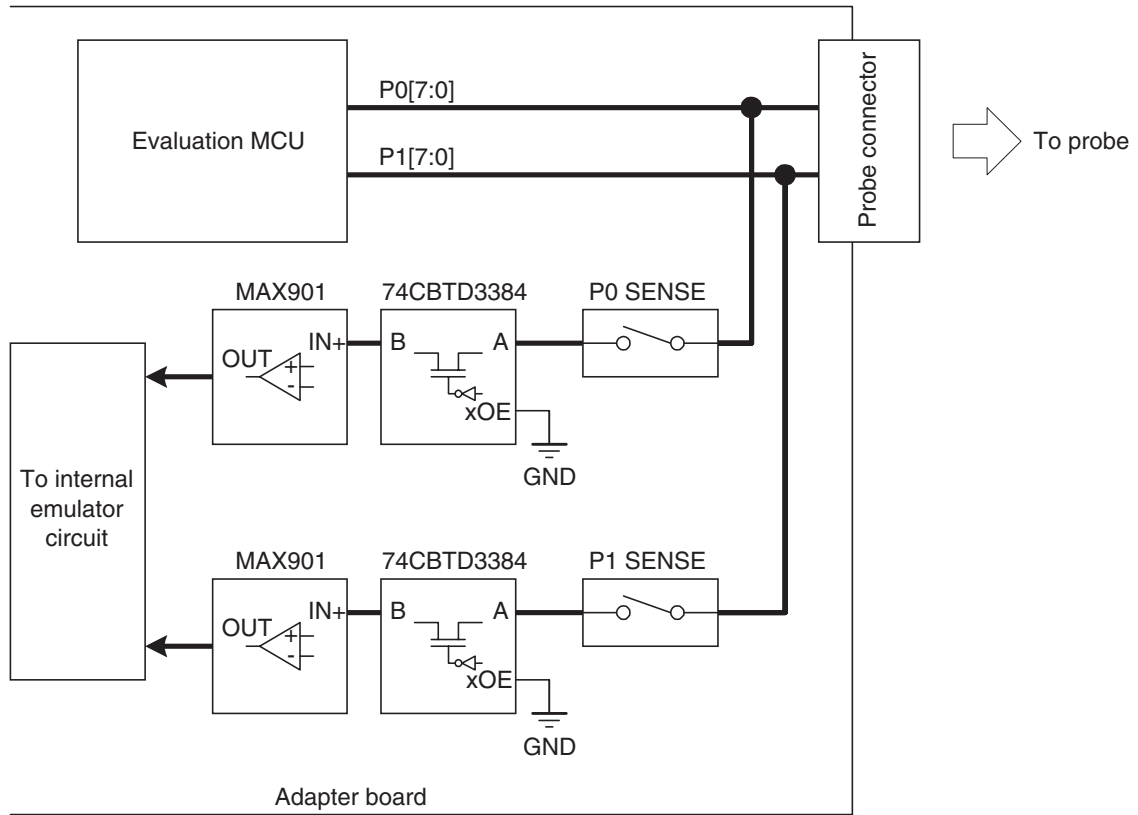
Probing target pin		1	2	3	4	5	6	7	8
P00 to P07 (P0 SENSE setting)	Connected	ON	ON	ON	ON	ON	ON	ON	ON
	Disconnected	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
P10 to P17 (P1 SENSE setting)	Connected	ON	ON	ON	ON	ON	ON	ON	ON
	Disconnected	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

Note:

This circuit has a function equivalent to that of a pull-up circuit with high resistance.

If all buses in the evaluation MCU and user system are in the Hi-Z state, about 3.0 V appears on the user data bus.

Figure 3.6-1 Configuration of the peripheral circuit for the user data bus selection switch



74CBTD3384 DC characteristic

Input current (I _{in})	1 μA
----------------------------------	------

MAX901 DC characteristic

Input current (I _{in})	10 μA
----------------------------------	-------

3.7 Using the Setting Switches

This section explains how to use the setting switches and the display on the status indicator LCD.

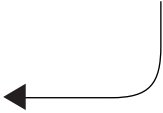

■ Functions of the setting switches

The setting switches can be used to change the information displayed on the status indicator LCD (called "LCD" in the rest of this manual) and change LAN parameters displayed on the LCD.

This section explains the menu displayed on the LCD and how to use the setting switches with by selecting from the menu. For details about use of the switches and information displayed on the LCD in menu selection mode or normal operation mode, see the *Softune Workbench Operation Manual*.

Table 3.7-1 "Functions of the setting switches" lists the functions of the setting switches.

Table 3.7-1 Functions of the setting switches

Key name	Marking created by silk screen printing	Information displayed on LCD	Function
ENTER key		Initial screen for emulator	Changes the screen to the menu.
		Menu	Changes display to the submenu of the selected item.
		LAN parameter	Sets the column (position) to be changed.
			Sets a new value (numeric value).
	Selection/Confirmation	Sets a selected item or terminates display after confirmation.	
Up/Down key		Menu	Scrolls display upward or downward.
		LAN parameter	Moves the cursor upward, downward, to the left, or to the right.
		LAN parameter	Increments or decrements the value (numeric value) to be changed.

■ Using switches to change parameter values

The following procedure applies to using the setting switches to change parameter values:

1. Display parameters on the LCD. Use the Up or Down key to move the blinking cursor (■) to the column (position) of the value to be changed.
2. Click the ENTER key to set the column (position) of the value to be changed. The cursor changes its form to "_" (underscore).
3. Use the Up or Down key to increment or decrement the defined value (numeric value) to the desired value (numeric value).
4. Click the ENTER key to confirm the new value (numeric value) to be set.
5. Change all values (numeric values) of the parameters to be modified. After that, use the Up or Down key to move the cursor to the location immediately to the right of "[OK]," and click the ENTER key to end the parameter value change operation.

■ Using switches for selection or confirmation

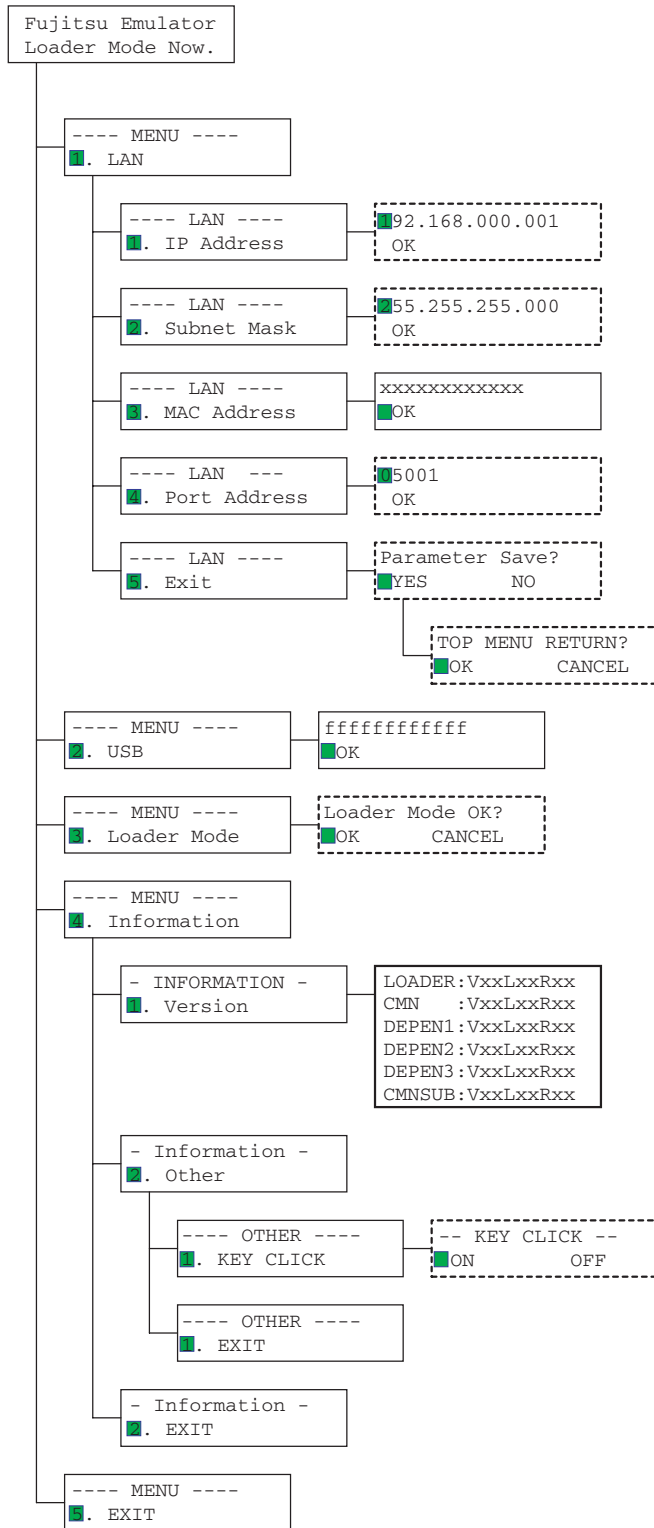
The following procedure applies to using the setting switches for selection and confirmation:

- For selection
Use the Up or Down key to move the cursor to the location immediately to the right of an item or command (e.g., [Yes] or [No]) to select the item or command, and click the ENTER key.
- For confirmation
Move the cursor to the location immediately to the right of [OK], and click the ENTER key.

■ Display configuration

Figure 3.7-1 "Menu configuration" shows the menu configuration.

Figure 3.7-1 Menu configuration



- This is the initial screen for the emulator. This screen appears first when the emulator is in the factory default that is set before shipment. The information displayed on this screen depend on the firmware registration status.
- This is the initial menu screen displayed and the LAN information menu.
- This screen displays an IP address and enables users to change it.
- This screen displays a subnet mask and enables users to change it.
- This screen displays a MAC address. The MAC address specific to the emulator is displayed.
- This screen displays a port address and enables users to change it.
- This screen enables users to save changed LAN parameter values.
- This screen enables users to select to end the display of the LAN information menu.
- This screen is reserved for displaying the USB information menu.
- This screen displays the loader information menu. Select [OK] to enable loading.
- This screen displays the information menu.
- This screen displays version information. Use the Up and Down keys to scroll the version information on the screen. To return to a higher-level screen, press the ENTER key.
- This screen displays other settings and enables users to change them.
- This screen enables users to turn on and off the clicking sound generated when a setting switch is clicked.
- This screen is used to end the display of other settings.
- This screen is used to end the display of the information menu.
- This screen is used to end the display of the menu.

3.8 Power-On Sequence

After making all necessary connections and settings, power on the host machine, emulator, and user system in this sequence.

For the first use of the emulator after shipment, the emulator must be initialized (monitor loading) before the power-on sequence of the user system.

■ Power-on sequence



Prohibition



Follow the procedure described in the manual to turn on the product. Doing so may result in device problems.

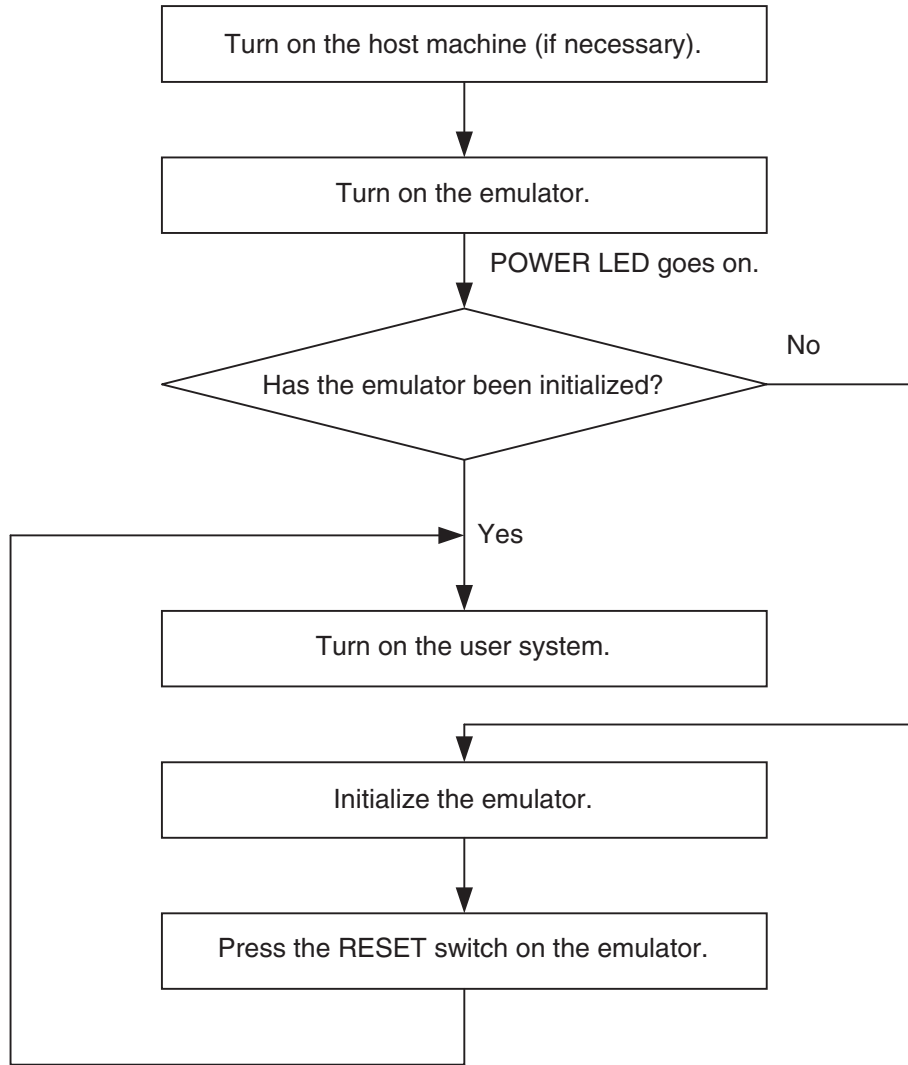
After power is turned on to the product, do not move the system, or apply any shock or vibration to it. Doing so may result in device problems.

Figure 3.8-1 "Power-on sequence" shows the sequence of power-on operations. Perform the power-on operations in this sequence after making all necessary connections and settings.

To turn on the emulator, push the POWER switch on the back panel of the emulator (see Figure 1.2-3 "Rear view of the emulator unit" for the location of the POWER switch). The POWER switch is then locked in the ON position (pushed in).

For the first use of the emulator after shipment, the emulator must be initialized (monitor loading) before the power-on sequence of the user system. For information on how to initialize it, see the *Softune Workbench Operation Manual*.

Figure 3.8-1 Power-on sequence



Note:

If the emulator has been sent to a factory for repair, the emulator is returned in the factory default (same as that at initial shipment). In this event, initialize the emulator before using it.

3.9 Power-Off Sequence

Power off the user system, emulator, and host machine in this sequence.

■ Power-off sequence



Prohibition

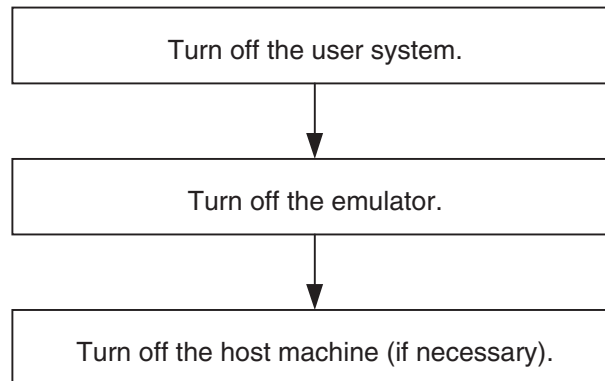


Follow the procedure described in the manual to turn off the product. Doing so may result in device problems.

Figure 3.9-1 "Power-off sequence" shows the sequence of power-off operations. Perform the power-off operations in this sequence.

To turn off the emulator power, push the POWER switch on the back panel of the emulator (see Figure 1.2-3 "Rear view of the emulator unit" for the location of the POWER switch). The POWER switch then returns to the OFF position (protruding).

Figure 3.9-1 Power-off sequence



CM42-00412-1E

FUJITSU SEMICONDUCTOR • CONTROLLER MANUAL
F²MC-16L/16LX EMULATOR
MB2147-01
HARDWARE MANUAL

July 2002 the first edition

Published **FUJITSU LIMITED** Electronic Devices
Edited Technical Information Dept.
